Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–IV EXAMINATION – WINTER 2025

Subject Code:3140601 Date:13-11-2025

Subject Name:Surveying

Time:02:30 PM TO 05:00 PM Total Marks:70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1 (a) Explain in brief purposes of tacheometry. (3)

Q.1 (b) Explain with sketches temporary adjustment of theodolite. (4)

Q.1 (c) Enlist various methods of plane table survey and explain any one in detail. (7)

Q.2 (a) Explain in brief GPS. (3)

Q.2 (b) Explain in brief difference between Fixed hair method and Movable hair method. (4)

Q.2 (c) Two tangents intersect at a chainage of 1600 m the deflection angle being 34^0. Calculate the following quantities for setting out a curve of radious 375 m. (7)

1. Tangent length 2. Length of long chord 3. Length of curve 4. Chainage of point of commencement and tangency 5. Apex Distance

OR

Q.2 (c) Explain in detail measurement of horizontal angle by repetition method using theodolite. (7)

Q.3 (a) Differentiate between plane surveying and geodetic surveying. (3)

Q.3 (b) Explain in brief instruments used in tacheometry. (4)

Q.3 (c) The following readings were taken with a tacheometer on a vertical shaft. Calculate the tacheometric constant. (7)

Instrument Station	Staff Station	Horizontal Distance	Stadia Reading
A	P	60 m	1.25 1.50 1.75
	Q	110 m	1.45 1.95 2.45

OR

Q.3 (a) Write advantages and disadvantages of plane table surveying. (3)

Q.3 (b) What is transition curve? Why and where it is provided? (4)

Q.3 (c) Explain in detail Gale's traverse table. (7)

Q.4 (a) Enlist various laws of weight. (3)

Q.4 (b) Explain in brief measurement of area by using planimeter. (4)

Q.4 (c) Enlist various methods of setting out simple circular curve and explain in detail one theodolite method of setting out a simple circular curve. (7)

OR

Q.4 (a) Discuss selection of triangulation station. (3)

Q.4 (b) Explain in brief vertical curves. (4)

Q.4 (c) The following offsets are taken from a survey line to a curved boundary line. (7)

Distance(m)	0	5	10	15	20	30	40	60	80
Offset (m)	3.40	2.60	3.90	4.30	5.90	4.40	3.70	3.30	1.90

Find the area between the survey line, the curved boundary line, and the first and last offsets by (I) The trapezoidal rule and (II) Simpson's rule

Q.5 (a) Explain in brief electromagnetic spectrum. (3)

Q.5 (b) Explain the following terms. (4)

1. Direct observations 2. Indirect observations 3. Most Probable value
4. Most probable error

Q.5 (c) An instrument was set up at A and the angle of elevation of the top of an electric pole BC was 36^0 42'. The horizontal distance between A and B , the foot of the pole was 402.60m. Determine the RL of the top of the pole C, if the staff reading held on a BM (RL 180 M) was 2.895 m with telescope in horizontal plane. (7)

OR

Q.5 (a) What is base line? How is it selected? (3)

Q.5 (b) Explain in brief various types of errors in surveying instruments. (4)

Q.5 (c) Explain in detail total station giving its uses and applications. (7)

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